Jersey Tea (*Ceanthus americanus* L.) does not look like the common and typical form of the species on the mainland of New England. I first collected the Cape Cod extreme in 1919, though the late Emile F. Williams had gathered good material as early as 1896; but until now my own collections have awaited identification. Upon examination the plant of the Middle Cape seems inseparable from *C. intermedius* Pursh, Fl. Am. Sept. i. 167 (1814), described from "woods of Tennassee [Pursh consistently wrote Tennassee]. . . . Leaves not one fourth the size of the foregoing species" (*C. americanus*). *C. intermedius* is treated by Trelease as *C. americanus*, var. *intermedius* (Pursh) Trelease in Gray, Syn. Fl. N. A. i[1]. 410 (1897) with a range from South Carolina and Tennessee ("acc. to Pursh") to Florida and Louisiana, the variety having the narrower leaves very much smaller than in typical *C. americanus* and the "peduncles very slender, mostly numerous." The shrub of middle Cape Cod well matches the small-leaved southern extreme, except that its leaves are more densely pubescent and it is certainly extremely floriferous, branches appropriate for the standard herbarium-sheet showing 10–37 inflorescences. On the "Upper" Cape (in Bourne) and elsewhere about Buzzards Bay the plant is typical *C. americanus* or slightly transitional to the variety.

The following northern specimens are referred to var. *intermedius*. Massachusetts: dry ground near Pleasant Lake, Brewster, August 3, 1911, *Sinnott;* border of dry woods, Brewster, *Fernald & Long*, no. 18,731; dense shrubs 3–6 dm. high, dry pine woods and clearings, Harwich, *Fernald*, no. 18,732; sandy bluff, Centerville, July 5, 1896, *E. F. Williams*,—M. L. Fernald, Gray Herbarium.

CAREX KNIESKERNII DEWEY

J. Penteado Bill, M.D.

While botanizing along the roadside in East Hebron, New Hampshire, in the summer of 1927, the writer gathered a strange looking *Carex*. Pressure of other matters prevented comparison of it with Gray Herbarium material until considerably later, when Prof. Fernald showed that it definitely matched *Carex Knieskernii* of Dewey.

As a result of his observation that this plant occupies a poorly defined status, these notes are offered as a contribution towards its possibly acquiring a more secure position.

In looking over the literature, the treatment accorded the plant

has appeared so diverse that it has seemed worth while briefly to review it.

One reason for the indefinite status is the rarity of the plant. This paucity of material has doubtless contributed negatively to the confusion, for there are but few recorded stations, and the plant is accordingly not familiar to the rank and file of collectors.

Dewey's original description appeared in 1846.[1] In the Gray Herbarium is a sheet of Dr. Knieskern's original collection, dated 1840, at Rome, New York. The chronology of subsequent collections represented at the Gray Herbarium is as follows.

Locality	Collector	Date
1. Rome, New York	P. D. Knieskern	1840
2. Rome, New York	George Vasey	June 5, 1846
3. Oriskany, New York	H. B. Sartwell	June 22, 1846
4. Near Kakabeka Falls, Ontario	John Macoun	July 14, 1869
5. Falls, Ste. Anne des Monts, Quebec	John Macoun	Aug. 25, 1882
6. Extreme North of Minnesota	L. H. Bailey, Jr.	July 24, 1886
7. Clifton, Michigan	O. A. Farwell	Aug. 1887
8. Caribou, Maine	M. L. Fernald Emile Williams J. F. Collins	July 18, 1902
9. Boonville, New York	J. V. Haberer	June 11, 1914
10. Newcomb, New York	H. D. House	July 15, 1920
11. Newcomb, New York	H. D. House	June 6, 1921
12. N. fork Madeleine River, Quebec	M. L. Fernald C. W. Dodge L. B. Smith	Aug. 12, 1923
13. East Hebron, New Hampshire	J. P. Bill	Sept. 7, 1927
14. North Pomfret, Vermont	Miss Lillibridge	July 5, 1928

Since the writer's addition to the then existing Gray Herbarium material, a sheet has been received from the Dana S. Carpenter herbarium, representing plants collected by Miss Lillibridge in North Pomfret, Vermont, on July 5, 1928.

Carex Knieskernii did not long remain a specific entity in the literature. In Wood's *Classbook of Botany* it first appears in the second edition in 1845. Wood's description subsequently remains unchanged until the edition of 1861 when Dewey, who revised the *Carices*, added[2] "Closely related to C. Sullivantii, but differs materially when mature, in the fruit, glume and long triquetrous achenium.

[1] Amer. Jour. of Sci. and Arts, 2nd Series, Vol. II, 1846, p. 245.
[2] p. 764.

Also, by the same marks, from C. arctata Boott, to which Carey improperly (as mentioned by Boott. t., 122) refers it."

Carey, in the first four editions of Gray's *Manual*, referred the plant without comment to *C. arctata*. In 1858, Boott,[1] in his *Illustrations of the Genus Carex*, in discussing *C. Sullivantii* Boott which "Mr. Sullivant found . . . . growing with *C. pubescens* and *C. gracillima*, and thinks . . . . may prove to be a hybrid between them," said "*C. Knieskernii*, Dewey, found in Oneida County, New York, a plant only known from a few immature specimens, is closely allied to it, differing merely in a smooth and more distinctly nerved perigynium. Mr. Carey has referred it to *C. arctata*, but the pilose culm and leaves, and the copious pellucid spots on the perigynium ally it more closely to *C. Sullivantii*."

In the fifth edition of Gray's *Manual*, published in 1867, the Genus *Carex* was revised "with . . . . alterations, chiefly from the subsequent investigations of the late Dr. Francis Boott, . . . and from notes furnished by Wm. Boott, Esq." In it the plant is taken up as a species next to *C. Sullivantii*, and separated from *C. arctata* by key characters concurrent with the text.

The unsatisfactory status of this sedge found expression when Dr. E. C. Howe asked[2] if anyone "can . . . . forward proof that *Carex Knieskernii*, Dew., is a good species?" He mentioned Dr. Gray's comparison of it with *C. Sullivantii*, and Dr. Vasey's then belief in its identity with the European *C. sylvatica* of Hudson. He closed his query by stating "Mr. William Boott writes me that *C. Sullivantii* and *C. Knieskernii* are one and the same."

Prof. L. H. Bailey treated the plant as a separate species in his Catalogue of North American Carices in 1884. Two years later he treated it under *C. arctata*[3] as "C. ARCTATA × FORMOSA?" and adds, after quoting Knieskern's, Vasey's and Macoun's localities, "Sterile." In the same year he writes[4] "CAREX ARCTATA × FLEXILIS. . . . . In a recent trip to the northern boundary of Minnesota, I found a quantity of this rare Carex and growing in such intimate association with C. arctata and C. flexilis that all doubt was at once removed as to its parentage. I had long been confident that the plant is a hybrid, and that Carex arctata is one of its parents, but it had not occurred to

[1] Vol. I, p. 51.
[2] Bull. Torr. Club, Vol. IX, 1882, p. 35.
[3] Proc. Amer. Ac. Arts and Sci., Vol. 22, 1886, p. 104.
[4] Bot. Gaz., Vol. XI, 1886, p. 328.

me that the rare Carex flexilis is the other parent. In the Synopsis of North American Carices I guessed at Carex formosa as being the other parent, although that plant had not been found in the vicinity of Lake Superior, where Professor Macoun had found the hybrid. Dr. Vasey has loaned me the original specimens of Carex Knieskernii, together with Carex flexilis from the same source, and adds this note: 'The original Carex Knieskernii was collected by myself, in company with Dr. Knieskern, on the ground of old Fort Bull, somewhere west or northwest of Rome, N. Y., near a small stream which, if I remember correctly, was called Fish Creek, and empties into Oneida Lake. The specimens of Carex flexilis are from the same locality.' This first collection was made in 1841. In 1869 Professor Macoun collected it at Kakabeka Falls, on the Canadian side of Lake Superior. The third finding was that of the present summer, a few miles this side of the international boundary. I obtained about a hundred specimens from two or three contiguous localities. . . . . ."

Macoun in 1888 followed this view, stating[1] "I agree with Prof. Bailey in believing this is a hybrid between *C. arctata* and *C. flexilis*. Where I gathered the specimens at Kakabeka Falls, on the Kaministiqua, thirty miles from Fort Williams, Lake Superior, both of these species were found growing in profusion. Specimens of *C. flexilis*, sent from Tobique Lake, N. B., by Wetmore, contained a fine clump of *C. Knieskernii*. It is just possible that after all it is a lax form of *C. flexilis*, as it certainly approaches that species very closely."

Bailey continued to hold his hybrid diagnosis.[2] In 1893 he stated[3] "It is by no means necessary to the diagnosis of a hybrid that both parents be found in its vicinity. One parent, or even both of them, may long since have died out and the hybrid may have persisted; yet the hybrid is usually associated with its pistillate parent."

Dr. Howe in 1895 expressed[4] the same belief in the plant's identity, while a year later, Dr. Britton summed up these views[5] by stating that "**Carex Knieskerni** Dewey, is probably a hybrid with *C. castanea* or *C. formosa*." Kükenthal in 1909 followed the generally accepted viewpoint of hybridity,[6] as did Mackenzie in 1913, though he discarded

[1] Cat. of Canadian Plants, Pt. IV, p. 162.
[2] Bailey in Gray's Manual, Ed. VI, 1889, p. 603.
[3] Bull. Torr. Club, Vol. XX, 1893, p. 419.
[4] Rept. New York State Botanist, 1895, p. 82.
[5] Ill. Flora of the U. S., 1896, I, p. 320.
[6] Engler's Pflanzenreich, IV, 20, p. 610.

C. formosa as a possibility.[1] Dr. House, however, in commenting[2] on material collected by Dr. Haberer in 1912, says "This species should, as Doctor Haberer points out in a note attached to his specimens, be restored to the company of valid species. The specimens [collected near Boonville, New York, in June, 1912] contain good achenes and no specimens of Carex arctata, with which species and Carex castanea it is suspected of being a hybrid, was growing near it. . . . Specimens of Carex are often sterile and it is possible that some of the earlier collections of this species were sterile, which led to its being regarded as a hybrid. Doctor Haberer's specimens are fertile. . . . ."

Dr. House in a later work[3] also treats the plant as a valid species.

C. castanea Wahl. (= *flexilis* Rudge) is sufficiently scarce as to be worthy of record when found. There are no sheets of New Hampshire material in either the Gray Herbarium or that of the New England Botanical Club. Further, there are no records for *C. castanea* in the local floras of Jesup for Hanover, New Hampshire (though its presence across the Connecticut River in Pomfret, Vermont, is recorded) in that of Harris for Windham, New Hampshire, Batchelder's of Manchester, New Hampshire, or in Pease's Flora of Coös County.

If *C. castanea* be one of the parents of *C. Knieskernii*, either it is yet to be discovered in New Hampshire, or it has been destroyed in the area above indicated because of some ecologically unfavorable factor.

In any event, in view of the absence of one reputed parent in the region where the writer's collection of *C. Knieskernii* was made, it would seem to him that the burden of proof of hybridity of this plant is very decidedly upon the protagonists of this theory. It would seem to the writer that his finding of the plant is but a further argument that *C. Knieskernii* is a specific entity, as Drs. House and Haberer pointed out fifteen years ago.

My grateful thanks are extended to Prof. M. L. Fernald and Mr. C. A. Weatherby for their courtesy and helpful suggestions.

Wayland, Massachusetts.

Volume 32, no. 379, including pages 119 to 142, was issued 28 June, 1930.

[1] Mackenzie in Britton and Brown, Ill. Flora of the U. S., Ed. II, 1913, I, p. 410.
[2] Rept. State Botanist, 1913. Bull. 592, Univ. State of N. Y., 1915, p. 34.
[3] Bull. 254, New York State Museum, 1924, p. 186.